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IS 6047 (2009): Scouring products for utensil cleaning - Specification [CHD 25: Soaps and other Surface Active Agents]



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भारतीय मानक
बर्तनों की सफाई के लिए अभिमार्जन उत्पाद —
विशिष्टि
(पहला पुनरीक्षण)

Indian Standard
SCOURING PRODUCTS FOR UTENSIL CLEANING —
SPECIFICATION
(*First Revision*)

ICS 71.100.40; 97.040.60

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 2

**AMENDMENT NO. 1 JUNE 2012
TO
IS 6047 : 2009 SCOURING PRODUCTS FOR UTENSIL
CLEANING — SPECIFICATION**

(First Revision)

[Page 2, Table 1, Sl No. (iv), col (6)] — Substitute ‘80 (Min)’ for ‘80 (Max)’.

(CHD 25)

Reprography Unit, BIS, New Delhi, India

Indian Standard

SCOURING PRODUCTS FOR UTENSIL CLEANING — SPECIFICATION

(First Revision)

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for dishes and utensil cleaning products.

2 REFERENCES

The following standards contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	Title
286 : 1978	Methods of sampling and test for soaps (<i>second revision</i>)
1070 : 1992	Reagent grade water — Specification (<i>third revision</i>)
4707 (Part 1) : 2001	Classification of cosmetics raw materials and adjuncts: Part 1 Dyes, colours and pigments (<i>second revision</i>)
4955 : 2001	Household laundry detergent powders — Specification (<i>fourth revision</i>)
5522 : 1992	Stainless steel sheets and strips for utensils — Specification (<i>second revision</i>)

3 TYPES

The materials shall be of four types, namely, Type 1 (Bar), Type 2 (Liquid), Type 3 (Paste) and Type 4 (Powder) based on the product form.

4 REQUIREMENTS

4.1 Description

The products may be a mixture of an active (cleansing) ingredient and suitable additives and builders. Appropriate list of suggested builders and additives, which can be used, is given in Annex A.

4.2 The materials shall also comply with the

requirements given in Table 1 when tested by the methods referred to in col 7 and 8 of the Table 1.

5 PACKING AND MARKING

5.1 Packing

The material shall be packed securely in plastics, wrappers, paper board containers, cartons, tubes, bottles as appropriate to the product form or as agreed to between the purchaser and the supplier.

5.2 Marking

The packages shall be marked with the following information:

- a) Name of the material and type;
- b) Weight of the material in the package 'When packed'. In case of liquids, it shall also be in volume, in ml;
- c) Name of the manufacturer and trade-mark, if any;
- d) Batch number;
- e) Date of manufacture (month and year); and
- f) Directions and instructions for usage.

5.2.1 BIS Certification Marking

The packages may also be marked with the Standard Mark.

5.2.1.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

6 SAMPLING

6.1 Representative samples of the material shall be drawn as prescribed under 3 of IS 286.

6.2 Test for checking the requirement for surface active ingredient of the material shall be conducted on individual samples and the rest of the tests shall be conducted on a composite sample.

Table 1 Requirements for Scouring Products for Utensil Cleaning
(Clause 4.2)

SI No.	Characteristic	Requirement				Method of Test, Ref to	
		Type 1 Bar	Type 2 Liquid	Type 3 Paste	Type 4 Powder	Annex	Clause No. in IS 286
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i)	Retention on 250-micron IS sieve, <i>Max</i>	0.1	—	0.1	0.1	B	—
ii)	Active matter, percent by weight, <i>Min</i>	8	12	12	2	C	—
iii)	Active (Reserve) alkalinity, in ml, <i>Max</i>	20	20	20	20	D	—
iv)	Matter insoluble in alcohol, percent by weight	80 (<i>Max</i>)	—	75 (<i>Max</i>)	80 (<i>Max</i>)	—	5
v)	Moisture and volatile matter content at 105°C, percent by weight, <i>Max</i>	10	—	—	3	—	4 (Oven Method)
vi)	Lather, in ml, <i>Min</i>	70	70	70	10	E	—
vii)	Cleaning efficacy, number of plates cleaned per 5 g of sample, <i>Min</i>	5	4	5	2	F	—
viii)	Tough soil cleaning in percentage, <i>Min</i>	20	5	20	30	G	—
ix)	Surface damage, <i>Max</i>	2	1	2	3	H	—

ANNEX A

(Clause 4.1)

LIST OF SUGGESTED BUILDERS AND ADDITIVES WHICH CAN BE USED FOR DISHWASH CLEANING PRODUCTS (EXCLUDING SURFACTANTS AND ABRASIVES)

- | | |
|---|--|
| 1. Borax | 21. Boric acid |
| 2. Colours | 22. Citric acid |
| 3. Perfume | 23. Sodium hydroxide |
| 4. Sodium bicarbonate | 24. Potassium alumino silicate |
| 5. Sodium carbonate | 25. Kaolin |
| 6. Sodium hypochlorite (not to be used in conjunction with AOS) | 26. Ethylene diamine tetra acetic acid |
| 7. Sodium perborate | 27. Hydrogen peroxide |
| 8. Sodium silicate | 28. Lauric acid |
| 9. Sodium sulphate | 29. Magnesium sulphate |
| 10. Aluminium sulphate | 30. Para toluene sulphonc acid |
| 11. Sodium tripolyphosphate | 31. Liquid paraffin oil |
| 12. Trisodium phosphate | 32. Precipitated silica |
| 13. Tetra sodium pyrophosphate | 33. Sorbitol |
| 14. Sodium hexametaphosphate | 34. Glycerine |
| 15. Urea | 35. Sodium chloride |
| 16. Polyethylene glycol | 36. Starch |
| 17. Sodium cumene sulphonate | 37. Zeolite |
| 18. Sodium xylene sulphonate | 38. Titanium oxide |
| 19. Sodium metasilicate | 39. Ethanol amines |
| 20. Sodium aluminate | 40. Dolomite |

ANNEX B

[Table 1, Sl No. (i)]

METHOD OF TEST FOR SIEVE ANALYSIS**B-1 APPARATUS**

250-micron IS Sieve

B-2 PROCEDURE

Weigh out 50.0 g of the test sample into a beaker and add 200 ml of water. Heat on a steam-bath, with frequent stirring, until all the soluble salts are dissolved. Pour the mixture on to the sieve and transfer the residue quantitatively to the sieve by washing the beaker several times with water. Using a fine stream of tap water, wash the insoluble matter through the sieve. Continue this washing until the amount of residue on the sieve, if any, appears to remain constant. Place the sieve in a basin, and continue washing the material on it for another 2

min. Repeat the washing of the sieve for 2 min. Dry the sieve and its contents, if any, at $100 \pm 5^\circ\text{C}$. Using a camel-hair brush, transfer the contents of the sieve quantitatively to a tared glass dish and determine the weight of the residue.

B-3 CALCULATION

Calculate as follows:

$$\begin{array}{l} \text{Insoluble matter retained} \\ \text{on 250-micron IS Sieve,} \\ \text{percent by weight} \end{array} = 100 \times \frac{w}{W}$$

where

 w = weight of the residue on the sieve, in g; and W = weight of the sample taken for the test, in g.**ANNEX C**

[Table 1, Sl No. (ii)]

DETERMINATION OF ACTIVE MATTER**C-1 OUTLINE OF THE METHOD**

First, it is determined whether the active cleansing ingredient is soap or synthetic detergent, and then the determination is made by the procedure, which is applicable depending on the type of the ingredient.

C-2 PROCEDURE

C-2.1 Weigh accurately about 5 g of the material and transfer it to a 150-ml beaker. Add about 50 ml of freshly boiled and cooled distilled water (see IS 1070) to the beaker and put the beaker on a hot plate for dissolving the material soluble in water. Continue stirring with a glass rod to ensure dissolution. Filter through a filter paper into a 100-ml flask. Wash the filter paper with hot water at least four times collecting the washings into the filtrate. Now cool the solution under a water tap and then add distilled water up to

the 100-ml mark.

C-2.2 Take about 10 ml of the above solution and add 3 ml of 3 (N) solution of hydrochloric acid. Fatty acids separate if the sample of scouring product is based on soap.

C-2.3 If the soap is found absent by the test given in C-2.2, take a fresh 10 ml solution (see C-2.1) in a test tube and test for the presence of anionic synthetic detergent as prescribed in B-2 of IS 4955.

C-2.4 Determine the total fatty matter content of the material by the procedure prescribed in 15 of IS 286, in case the scouring product is based on soaps.

C-2.5 Determine the surface active ingredient content of the material by the procedure prescribed in B-5 of IS 4955, in case the scouring product is based on synthetic detergents.

ANNEX D

[Table 1, Sl No. (iii)]

DETERMINATION OF ACTIVE (RESERVE) ALKALINITY**D-1 PRINCIPLE**

Reserve alkalinity is expressed as amount of 0.1(N) hydrochloric acid in ml required for 50 ml of 1 percent solution of product sample to lower its pH to 8.0.

D-2 APPARATUS**D-2.1 pH Meter****D-2.2 Beaker**, 250-ml and 100-ml capacity.

D-2.3 Magnetic Stirrer**D-2.4 Burette****D-3 REAGENTS**

Hydrochloric acid 0.1N.

D-4 PROCEDURE

Weigh accurately 1.0 g of sample in a 250-ml beaker. Add 100 ml of distilled water and dissolve the sample. Filter through Whatman filter paper No.42 and collect the filtrate. Pipette out 50 ml of filtrate in a 100 ml beaker. Place the beaker on a magnetic stirrer and mix

thoroughly. Note down the pH of solution using pH meter. With the electrode of pH meter dipping in solution and keeping the pH meter on, add drop by drop of 0.1N hydrochloric acid from a burette till the pH of the solution drops to 8.0. While adding hydrochloric acid stir the solution continuously. Note the amount of hydrochloric acid required to bring down the pH of solution to 8.0 which is a measure of the reserve alkalinity of the test sample.

NOTE — Average of 2 replicate measurements will give reserve alkalinity expressed as amount in ml of 0.1N hydrochloric acid.

ANNEX E

[Table 1, Sl No. (vi)]

ASSESSMENT OF LATHER**E-1 SCOPE**

This method prescribes the method of test for evaluating the foaming tendency of dishwash products.

E-2 OUTLINE OF THE METHOD

The method involves shaking of required concentration test solution in a graduated cylinder under standard conditions to generate foam. The volume of foam measured, in ml is noted as a measure of foaming tendency for the given test product.

E-3 REQUIREMENTS

- 250-ml graduated measuring cylinder (with a least count of 1 ml),
- 5 FH water (50 ppm CaCO_3),
- Product to be assessed,

- Clamp and stand,
- Stopwatch/clock,
- 500-ml volumetric flask, and
- Three trained panel members.

E-4 PROCEDURE

Prepare 500 ml of 0.25 percent aqueous test solution in volumetric flask using 5 FH water. Pipette out 50 ml of test solution in 250-ml graduated cylinder. Shake the cylinder upside down 10 times and then place the cylinder on flat surface of table. Wait for 1 min for aqueous layer to separate and shake the cylinder upside down once to even out the foam level. Measure the volume of foam (excluding aliquote water), in ml. Repeat the test in triplicate with 3 different panel members.

NOTE — FH stands for French Hardness.

ANNEX F

[Table 1, Sl No. (vii)]

CLEANING EFFICACY TEST (GREASE REMOVAL)**F-1 SCOPE**

This method prescribes the method of test for evaluating the grease removal efficacy of dishwash products.

F-2 OUTLINE OF THE METHOD

The method involves the cleaning of soiled plates with dishwash test product through direct application consumer wash habit. The cleaning is carried out using product picked-up through wet nylon wire puff and cleaning soiled plates by giving predetermined number of rubs under standard conditions.

F-3 REQUIREMENTS

- Stainless steel (SS 304, see IS 5522) plates of about 20 to 25 cm diameter (A stock of 25 to 30 plates is required).
- Nylon wire puff.
- Rubber bung, about 2 cm diameter.
- Graduated pipette.
- Soil — A mixture of vanaspati (hydrogenated vegetable oil) and soft edible oil (Ground nut oil) in the ratio of 80 : 20.
- Three trained panel members for carrying out plate cleaning.

F-4 SOILED PLATE PREPARATION

Pipette out 0.5 ml soil onto each stainless steel plate. Spread the same evenly on the plate with the rubber bung. Add 5 ml of water (containing Ca as 50 ppm CaCO_3) on each plate. Allow the plates to age for 30 min after stacking one over the another.

F-5 TEST PRODUCT SAMPLE PREPARATION

F-5.1 In case of dishwash bar, prepare 10 g of 50 percent paste using finely grated product mass and 5 FH (50 ppm CaCO_3) water in a porcelain dish.

F-5.2 In case of dishwash powder/paste/liquid, take 5 g of representative sample directly for testing in porcelain dish.

F-6 PLATE CLEANING PROCEDURE

Remove the top soiled plate from the stack. Pick approximately 0.5 g of test product sample (50 percent paste in case of dish wash bar) prepared above using wet nylon wire puff. Rub the front of the plate with

nylon puff containing the product making 6 turns clockwise and 6 turns anti-clockwise covering the entire soiled surface on the plate. Reverse the plate and rub with the used nylon puff 3 times clockwise and 3 times anticlockwise. Rinse the washed plate in thin running tap water. Observe the extent of cleaning to achieve oil free complete washed plate. Oil free complete cleaning is confirmed by observing the continuous sheet of water flow across the plate without getting cut. Oily plates results in cut (break) of water flow across the plate surface where the oily stains remain uncleaned. In case of incomplete cleaning, pick-up minimal quantity of test product sample onto the nylon puff and repeat cleaning to complete satisfactory cleaning. Continue cleaning of plates one by one till 5 g of test sample is exhausted. In case of scourer bar, the paste quantity of 10 g would correspond to 5 g of the bar sample. Record the result as 'Number of plates cleaned per 5 g of sample'. Carry out 3 replicate assessments for each test sample using 3 different trained panel members and report the average figure.

ANNEX G

[Table 1, Sl No. (viii)]

TOUGH SOIL CLEANING TEST

G-1 SCOPE

This method gives an estimation of the fixed soil cleaning power of dishwash products.

G-2 MATERIALS

- a) Stainless steel plates (SS 304, 1.3 mm thick, 20×10 cm),
- b) Nylon scrubber,
- c) Wheat flour,
- d) *Besan* flour,
- e) Rice flour,
- f) Vegetable oil,
- g) Weighing balance (least count 0.001 g),
- h) Hot plate (up to 400°C),
- j) Pair of tongs,
- k) Beaker,
- m) Glass rod, and
- n) Brush.

G-3 SOIL

In a glass beaker mix 16.5 percent wheat flour, 16.5 percent *besan* flour, 17 percent rice flour and 50 percent vegetable oil by mass thoroughly with a glass rod.

G-4 SOILED PLATE PREPARATION

The clean stainless steel plate is weighed (W_1). The soil solution is spread evenly on the stainless steel plate using a brush such that the soil loading is 0.2 g/cm^2 . This soiled plate after ageing for 30 min is heated on a hot plate set at 325°C for 2 min. The soiled plate is then cooled to room temperature (25°C) and aged at room temperature for 2 h. The soiled plate is weighed now (W_2).

G-5 CLEANING PROTOCOL

- a) Bar products — 50 percent solutions, 2 g;
- b) Scourer powders — 1 g;
- c) Liquid products — 1 g; and
- d) Paste — 1 g.

Take the product directly on the soiled plate. Wet the nylon scrubber and shake it to remove excess water. The plate is then manually cleaned for 30 seconds with to and fro movements (in the range of 60 to 70 cycles). One cycle is one complete to and fro motion. The plate is rinsed and dried in an oven at 50°C for 30 min. After bringing to room temperature, the plate is reweighed (W_3).

$$\text{Tough soil cleaning in percentage} = \frac{W_2 - W_3}{W_2 - W_1} \times 100$$

ANNEX H

[Table 1, Sl No. (ix)]

SURFACE DAMAGE TEST

H-1 SCOPE

This method gives an estimation of substrate damaging ability of dishwash products during cleaning.

H-2 MATERIALS

- a) New stainless steel plates (SS 304, *see* IS 5522) of 20 cm diameter,
- b) Nylon scrubber,
- c) Vegetable oil (Ground nut oil for example),
- d) Weighing balance (least count 0.001 g),
- e) Beaker,
- f) Glass rod, and
- g) Brush.

H-3 SOILED PLATE PREPARATION

Two grams of the oil is evenly spread on the stainless steel plate using a brush. This is the soiled plate, which will be used for the test.

H-4 CLEANING PROTOCOL

- a) Bar products — 50 percent solutions, 4 g;
- b) Scourer powders — 2 g;
- c) Liquid products — 2 g; and
- d) Paste — 2 g.

Take the product on the soiled plate. The nylon scrubber is wetted and rubbed 200 times using normal effort (100 clockwise and 100 anticlockwise). When

liquid product is used, a soft sponge is used as the implement instead of nylon scrubber. The plate is finally rinsed and dried. Now the plate is assessed by looking at the assessors face reflection.

H-5 ASSESSMENT

The reflection of objects is a useful indicator of the nature of metallic surface. The nature of reflected object is used to rank the products in terms of the damage inflicted on stainless steel surface. A visual ranking system is used as per the table below:

<i>Rank</i>	<i>Nature of the Reflected Image on Stainless Steel Surface</i>
1.	Complete image is reflected in a sharp manner with high contrast. The surface is free of any scratches.
2.	While the image is clear and has a sharp outline, there are number of visible scratches running across the image.
3.	The image is no longer clear. The outline is not defined and the scratch density is high.
4.	The image is totally obscured and it is difficult to see the image. The surface is full of dense scratches.

Based on the test and matching of the resultant surface with the above description, various dishwash products are classified into the appropriate ranks.

ANNEX J

(Foreword)

COMMITTEE COMPOSITION

Soaps and Other Surface Active Agents Sectional Committee, CHD 25

Organization

In personal capacity (102, Panchratna Complex, Bedala Road, Udaipur 313001)

Association for Consumer's Action on Safety and Health, Mumbai

Central Pollution Control Board, Delhi

Chemical Laboratory, New Custom House, Mumbai

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SHRI YOGESH KAMDAR (*Alternate*)

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